PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Tsuyoshi NAKAMURA, et al.

Docket No: Q80608

Appln. No.: 10/805,214

Group Art Unit: 3652

Confirmation No.: 9125

Examiner: Charles N. GREENHUT

Filed: March 22, 2004

For: POSITIONING DEVICE

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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I. REAL PARTY IN INTEREST - 37 C.F.R. § 41.37(c)(1)(i)

The real party in interest is assignee NSK, Ltd. of Japan, by virtue of an assignment recorded at reel 015123, frame 0629.

II. RELATED APPEALS AND INTERFERENCES - 37 C.F.R. § 41.37(c)(1)(ii)

There are no prior or pending appeals, judicial proceedings or interferences known to the appellant which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS - 37 C.F.R. § 41.37(c)(1)(iii)

Claims 1-9 are all the claims presented in this application. Claims 1-9 are pending, have been rejected, and are the subject of this appeal.

IV. STATUS OF AMENDMENTS - 37 C.F.R. § 41.37(c)(1)(iv)

There have been no amendments made after the Examiner's Final Office Action as mailed on July 27, 2007. Accordingly, the claims stand as presented before the Final Office Action.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER - 37 C.F.R. § 41.37(c)(1)(v)

The presently claimed invention relates to a positioning device capable of moving a work in a chamber isolated from the external environment. Page 1, lines 5-7.

In a semiconductor manufacturing apparatus, a work is placed on a stage and is moved to be treated in a process chamber kept under vacuum or in a special gas atmosphere. When the positioning device is disposed in the process chamber, a lubricant to be supplied to a moving portion of the positioning device may splash to contaminate the inside of the process chamber. Page 1, lines 9-15.

To avoid this problem, a positioning device using a differential pumping seal has been used between a moving member and a casing. Page 1, line 16 - page 2, line 6. However, in this type of positioning device, the casing is made so highly rigid as to stand the vacuum, that it has a very high weight. When the positioning device is moved, the center of gravity moves, which results in the problem that the surface plate (frame) is distorted. Page 2, lines 7-13. When the surface plate is distorted, the small clearance between the casing and the moving block varies so that the performance of the differential pumping seal varies or so that the casing and the moving block comes into direct contact with each other to obstruct their relative movements. Page 2, lines 13-18.

In order to overcome this problem, there may be used a surface plate of higher rigidity. However, then, another problem arises in that the area for the location of the positioning device is restricted or the cost for that location rises. Further, when maintenance is necessary, the moving block may need to be isolated from the casing. However, this isolation requires a large-scale disassembly including the pipings connected to the casing. Page 2, lines 18-24.

In view of the above-noted problems of the related art, therefore, the presently claimed invention has an object to provide a positioning device capable of exhibiting an intrinsic function irrespective of the distortion of a surface plate, and of ensuring ease in maintenance. Page 3, lines 2-6. See, also, page 14, line 12 - page 18, line 10, and page 22, lines 11-20.

In order to achieve the above objects, with reference to the exemplary embodiment of Fig. 1, the positioning device of claim 1 comprises:

a casing **102/120/170** having an opening **120a** and a process chamber **P** kept in an environment different from the outside **{p. 7, line 24 - p. 8, line 2; p. 8, lines 12-17; and p. 10, lines 3-5}**;

a table **105** arranged in said process chamber **P** **{p. 14, lines 16-19}**;

a connecting portion **131** connected to said table **105** and extending through said opening **120a** to the outside **{p. 10, line 23 - p. 11, line 3}**;

a moving portion **130** connected to said connecting portion **131** outside of said process chamber **P** **{p. 8, lines 3-4}**;

a base **103** for supporting said moving portion **130** movably **{p. 8, lines 9-10}**;

a differential pumping seal **150** arranged between said casing **102/120/170** and said moving portion **130** **{p. 8, lines 18-22; p. 9, lines 1-13; p. 9, line 17 - p. 10, line 2; and p. 11, line 25 - page 12, line 17}** ; and

adjusting support mechanisms **190** for supporting said base **103** and said casing **102/120/170** in a relatively displacing manner so as to hold a clearance between said base **103** and said casing **102/120/170** constant **{p. 8, lines 10-12; p. 13, line 14 - p. 14, line 11; p. 18, line 11 - p. 20, line 25; p. 21, line 24 - p. 22, line 10; p. 23, line 4 - p. 24, line 2; and p. 25, lines 9-18}**.

VI. GROUNDS OF REJECTION FOR REVIEW ON APPEAL - 37 C.F.R. § 41.37(c)(1)(vii)

Ground 1 The Examiner rejected claims 1-3, 8, and 9, under §103(a) as being unpatentable over US Patent 6,120,609 to Selyutin (hereinafter Selyutin) in view of US Patent 4,726,689 to Pollock (hereinafter Pollock).

Ground 2 The Examiner rejected claims 4, 6, and 7, under §103(a) as being unpatentable over Selyutin in view of Pollock and further in view of US Patent 5,073,912 to Kobayashi (hereinafter Kobayashi).

Ground 3 The Examiner rejected claim 5 under §103(a) as being unpatentable over Selyutin in view of Pollock and further in view of US Patent 2,908,472 to McDonald (hereinafter McDonald).

VII. ARGUMENT - 37 C.F.R. § 41.37(c)(1)(viii)

Ground 1 *The Examiner rejected claims 1-3, 8, and 9, under §103(a) as being unpatentable over US Patent 6,120,609 to Selyutin (hereinafter Selyutin) in view of US Patent 4,726,689 to Pollock (hereinafter Pollock).*

Appellants respectfully traverse this rejection because, for the following five reasons, the references fail to teach or suggest all of the elements as set forth and arranged in the claims. Yet, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.[1] Further, all words in a claim must be considered in judging the patentability of that claim against the prior art.[2]

First, Selyutin fails to disclose both a moving portion and an adjusting support mechanism (which also imparts movement), as set forth in claim 1.

In Selyutin, there is disclosed a self alignment lift mechanism in which moving only in a one direction, by one device, is allowed.

On the other hand, a positioning device as presently claimed allows two different movements, i.e., by the adjusting support mechanism so that the clearance between the base and the casing remains constant. On page 9, line 4, it is described that "the moving block 130 can move in the direction normal to the sheet of Fig. 1 (or upward and downward of Fig. 2)." And also by the recitation that the base portion "support[s] said moving portion movably".

Therefore claim 1 arrangement is completely different than the lift pin arrangement of Selyutin. Moreover, Pollock fails to cure the above-described deficiency in Selyutin. The lack of a moving portion and the lack of an adjusting support mechanism are further discussed below.

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[1] *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

[2] *In re Wilson*, 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970).

Second, Selyutin fails to teach or suggest the claimed moving portion, i.e., wherein there is a differential pumping seal located between the case and the moving portion. Although Selyutin includes a connection portion (member 30/32[3]) and a base (member 34 or 238), it fails to teach or suggest a moving portion, wherein there is a differential pumping seal between the case and the moving portion.

The Examiner asserts that the moving portion is disclosed in Selyutin's Figs. 10-15. However, Appellants are unable to identify which member corresponds to the moving portion. The Examiner asserts that the member 34 (corresponding to element 238 in Fig. 10) corresponds to a base; therefore member 34 is not a moving portion. Further, there is no member which is both supported by the base 34 for horizontal movement, and is connected to a connecting portion 30, shown in Figs. 10-15 of Selyutin. If element 30 were to be a moving portion connected to base 34/238, then there is no connecting portion extending through the opening in the casing 38.

[3] Elements 30 and 32 are not separately discussed in Selyutin. It is likely that element 32 is the hollow interior of shaft 30. See, for example, col. 1, line 53 - col. 2, line 9.

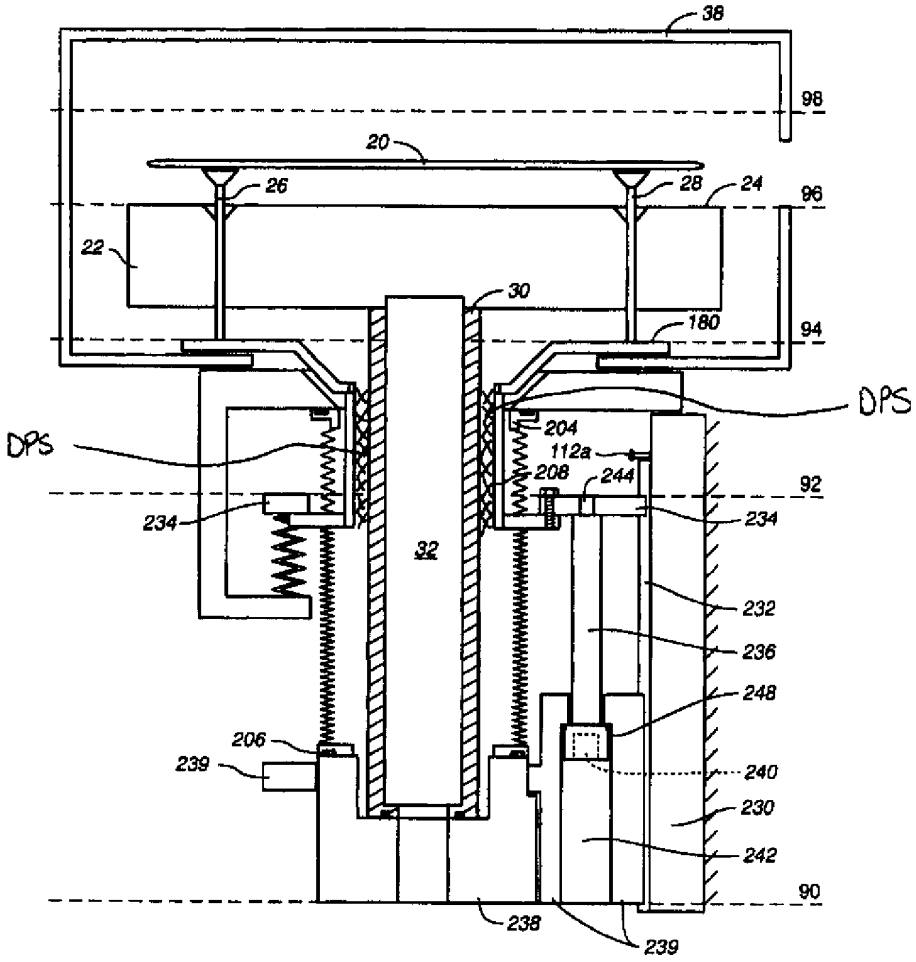


FIG._10

As shown in Fig. 10 of Selyutin, as reproduced above and annotated, one of ordinary skill in the art—following the teachings of Pollock—would have been motivated to provide a differential pumping seal between the connection portion (member 30/32) and the case (38). See, for example (DPS) as annotated into Selyutin's Fig. 10. That is, with reference to Pollock's figures, he teaches a differential pumping seal between shaft 10 that is moved into and out of case 50 through tube 40. Thus, one of ordinary skill in the art, following Pollock's teachings, would have provided the DPS between Selyutin's shaft 30/32 (connecting portion) and casing 38. Thus, the combination of Selyutin and Pollock would not include a differential pumping seal between a moving member (not taught by Selyutin) and the case (Selyutin's 38), as set forth in claim 1.

That is, member 239 cannot be construed as a moving portion because there is no differential pumping seal between that element and the case. Further, if Selyutin's shaft 30/32 is a moving member, then there is no connecting portion.

Third, Selyutin fails to teach or suggest an adjusting support mechanism and a moving member if Selyutin's member 239 is the adjusting support mechanism.

In the presently claimed invention, as described in the present specification at page 4, lines 3-9, one purpose of the adjusting support mechanism is that "even in case the casing is distorted by its own weight when it is placed on the surface plate, the adjusting support mechanisms causes the relative displacement to hold the clearance between the base and the casing constant, so that the unexpected contact between the two can be prevented to keep the performance of the differential pumping seal best." That is, the adjusting support mechanism is provided for maintaining the clearance between the base and casing; i.e., for adjusting the position of the base in a vertical direction so as to maintain the clearance.

In contrast to that set forth in claim 1, Selyutin's member 239 is a mechanism for moving a work. This member 239 changes the clearance between a member 34 (base, see also 238 in Fig. 10) and casing so as to achieve relative displacement. That is, member 239 moves the base 34 in a vertical direction. Thus, if element 239 is the adjusting support mechanism, there is no moving portion. Therefore, Selyutin does not disclose the adjusting support mechanism to maintain the clearance, and a moving portion.

Fourth, stating the above in a different way, the combination of Selyutin and Pollock fails to teach or suggest a differential pumping seal arranged as claimed.

More specifically, the claims set forth that the differential pumping seal is located between the moving member and the casing.

In contrast, as shown above, one of ordinary skill in the art—following the teachings of the references as a whole—would have placed the differential pumping seal (DPS) between Selyutin's connecting portion 30/32 and casing 38; it would not have been placed between a "moving portion" and the casing, as claimed; again, Selyutin teaches no moving portion as claimed.

Fifth, the Examiner's use of Selyutin is improper. The Examiner fails to specify what element of Selyutin corresponds to the claimed moving portion. On page 4, item 3, of the office

action, the Examiner asserts that since the "lift mechanism" is comprised of various elements, the lift mechanism can be considered as the claimed moving portion. However, just because a reference discloses many different elements, that does not mean that it includes a disclosure of a particularly claimed element. Instead, the Examiner has failed to explain the rejection with specificity, as he is required to do. As is set forth below with specificity, Selyutin fails to teach or suggest a moving portion as claimed.

In claim 1, the moving portion has three features as follows:

(i) the moving portion is connected to the connecting portion outside of the process chamber;

(ii) between the moving portion and the casing, a differential pumping seal is arranged; and

(iii) the moving portion is supported by the base movably.

There is no member in Selyutin that meets all three features (i) to (iii) above so as to constitute a moving portion.

With reference to Fig. 1 (and Fig. 10) of Selyutin, and feature (i), one of the members connected to Selyutin's connecting portion 30/32 is base 34. Because the base 34 is clearly a separate element from the moving portion in claim 1, Selyutin's member 34 cannot correspond to the moving portion; it already corresponds to the base (compare element 238 of Fig. 10).

In analyzing the other members disposed near the connecting portion 30/32:

(a) the member 31 (see Fig. 1) is connected to the connecting portion 30/32. However, similar to the discussion above, a member corresponding to the differential pumping seal would not be disposed between that member and the casing 38, nor is the member 31 supported by the base 34. Therefore, Selyutin's member 31 does not meet the features (ii) and (iii); and

(b) the member 66 is separate from the connecting portion 30/32. In fact, member 66 is connected to the case 38. Therefore, member 66 does not meet the feature (i).

No other members are disposed near the connecting portion 30/32 (in Fig. 10, element 238 is the only one, outside of the process chamber, that is connected to connecting portion 30/32).

Therefore, Selyutin fails to teach or suggest the claimed moving portion.

The Examiner cites Pollock as teaching a differential pumping seal. However, Pollock fails to cure the above-noted deficiencies in Selyutin. Accordingly, for the sake of argument alone, even assuming that one of ordinary skill in the art were motivated to combine Selyutin and Pollock as suggested by the Examiner, any such combination would still fail to render obvious Appellants' claim 1. Likewise, these references fail to render obvious the dependent claims 2, 3, 8, and 9.

Ground 2 *The Examiner rejected claims 4, 6, and 7, under §103(a) as being unpatentable over Selyutin in view of Pollock and further in view of US Patent 5,073,912 to Kobayashi (hereinafter Kobayashi).*

Appellants respectfully traverse this rejection because the references fail to teach or suggest all of the elements as set forth in the claims.

As noted above the Examiner's attempted combination of Selyutin and Pollock is deficient. The Examiner cites Kobayashi as teaching an electric drive. However, Kobayashi fails to cure the above-noted deficiencies in Selyutin and Pollock. Accordingly, for the sake of argument alone, even assuming that one of ordinary skill in the art were motivated to combine Selyutin, Pollock and Kobayashi as suggested by the Examiner, any such combination would still fail to render obvious Appellants' claims.

Ground 3 *The Examiner rejected claim 5 under §103(a) as being unpatentable over Selyutin in view of Pollock and further in view of US Patent 2,908,472 to McDonald (hereinafter McDonald).*

Appellants respectfully traverse this rejection because the references fail to teach or suggest all of the elements as set forth in the claims.

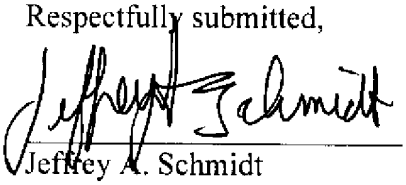
As noted above the Examiner's attempted combination of Selyutin and Pollock is deficient. The Examiner cites McDonald as teaching a hydraulic drive. However, McDonald fails to cure the above-noted deficiencies in Selyutin and Pollock. Accordingly, for the sake of argument alone, even assuming that one of ordinary skill in the art were motivated to combine Selyutin, Pollock and McDonald as suggested by the Examiner, any such combination would still fail to render obvious Appellants' claim.

Conclusion

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: May 31, 2007

CLAIMS APPENDIX

Claims 1-9 on Appeal:

1. A positioning device comprising:

a casing having an opening and a process chamber kept in an environment different from the outside;

a table arranged in said process chamber;

a connecting portion connected to said table and extending through said opening to the outside;

a moving portion connected to said connecting portion outside of said process chamber;

a base for supporting said moving portion movably;

a differential pumping seal arranged between said casing and said moving portion; and

adjusting support mechanisms for supporting said base and said casing in a relatively displacing manner so as to hold a clearance between said base and said casing constant.

2. A positioning device according to Claim 1,

wherein said casing is placed on a surface plate, and

wherein said base is placed on said surface plate through said adjusting support mechanisms.

3. A positioning device according to Claim 2,

wherein said base is supported at three points or more by support portions of said adjusting support mechanisms.

4. A positioning device according to Claim 1,

wherein each of said adjusting support mechanisms includes: a first adjusting portion for displacing said base and said casing in a first extent relatively to each other; and a second adjusting portion for causing the displacement in a smaller extent than said first extent.

5. A positioning device according to Claim 1,

wherein said adjusting support mechanisms include hydraulic drive sources.

6. A positioning device according to Claim 1,

wherein said adjusting support mechanisms include electric drive sources.

7. A positioning device according to Claim 6,

wherein said adjusting support mechanisms include means for suppressing the relative displacement of said base and said casing when no electric power is supplied.

8. A positioning device according to Claim 1,

wherein said casing includes a process chamber casing having a first opening for accessing said process chamber, and a seal plate having a second opening and arranged between said process chamber casing and said moving portion,

wherein said connecting portion extends through said first opening and said second opening, and

wherein an O-ring or a bellows is so arranged between said process chamber casing and said seal plate as to enclose said first opening and said second opening.

9. The positioning device according to claim 1, further comprising a drive unit connected to the moving portion through a connecting portion for moving the moving portion.

EVIDENCE APPENDIX:

NONE

RELATED PROCEEDINGS APPENDIX

NONE